



## ORIGINAL RESEARCH ARTICLE

# EFFECTIVENESS OF HELPING BABIES BREATHE (HBB) TRAINING ON KNOWLEDGE FOR HEALTH PROFESSIONALS AND MEDICAL STUDENTS AT CHITWAN MEDICAL COLLEGE

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### ABSTRACT

The educational effectiveness of HBB training on newborn simulator, knowledge of trainees from Doctors, Nurses and Medical Students was evaluated before and after training on 19 & 20 March, 10 & 11 April and 6 & 7 May 2014 respectively. A post course practical skills evaluation was performed on a Neonatal Newborn Simulator. Participants underwent a 2 day training course of 5 hours each. Thirty nine participants completed the course. The percentages of correct answers on a written test significantly increased from 82% to 99% after training. 100% of the trainees achieved passing scores. The trainees who participate in HBB training can significantly improve their knowledge and skills on simulators.

**Key Words:** *Asphyxia, Helping Babies Breathe, Resuscitation, Morphine, Neonatal mortality, Pethidine, Still Birth azolam.*

### INTRODUCTION

In the past decade, reducing neonatal death has been an emerging challenge in low and middle income countries. In order to reduce deaths from birth asphyxia, the development of the low cost interventions and their effective delivery are needed. The Millennium Development Goals 4 and 5, aimed respectively at reducing child mortality and improving maternal health, <sup>1</sup> nearly all (99%) intrapartum-related deaths occur in low and middle income countries with 60 million births each year outside health facilities and up to one-half without a skilled birth attendant. <sup>2,3</sup>

A low cost intervention, basic neonatal resuscitation within the first few minutes of life can substantially prevent neonatal mortality and morbidity attributable to intrapartum-related hypoxic events.<sup>2</sup> Three to six percentage of all newborns require basic resuscitation at birth, while advanced care, including endotracheal intubation, chest compression and use of drugs, are needed in <1% of births. Furthermore, most of these newborns that need advanced resuscitation will also require continuous intensive care, something that is lacking in many under developed and developing countries. In most cases, bag and mask resuscitation suffices for babies who need assistance breathing under those circumstances.<sup>3,4</sup>

In context of underdeveloped country like Nepal, there have been remarkable reductions both under- five mortality over the last 15 years. However, the reduction in neonatal and perinatal mortalities has been relatively slow. Neonatal mortality contributes 61 % of all the under five deaths according to the Nepal Demographic Health Survey 2011. Despite the coverage

of skilled birth attendance at birth has doubled in the last five years, the neonatal mortality has stagnated within the same period.<sup>5</sup>

Helping Babies Breathe at Birth is a response to reduce the burden of intrapartum deaths and facilitate health workers implements effective resuscitation practices. It was developed by the American Academy of Pediatrics which is a simplified neonatal resuscitation protocol. HBB is designed as educational program in resource limited settings. It seeks to prepare birth attendants to care for healthy newborns and those who are not breathing at birth. <sup>6,7</sup>

Ideally, at every birth there should be a skilled person who can provide essential services to both mother and infant, including HBB. Helping Babies Breathe is focused on the first sixty seconds, i.e. first minute of birth, also called Golden Minute, when either stimulating or ventilating with bag and mask can save a life.<sup>7,8</sup>

### MATERIALS AND METHODS

After getting ethical clearance from CMC-Institutional Review Committee, this study was conducted at Chitwan Medical College Teaching Hospital, Chitwan, Nepal. It included 4 Doctors, 17 Nurses and 18 Medical Students (Convenience Sampling).

### Instructors and participants

The HBB course was facilitated by a Master Trainer HBB and

2 senior Nurses who had been trained HBB course for 2 days. A total of 39 Doctors, Nurses and Medical Students were invited to participate on 19 & 20 March, 10 & 11 April and 6 & 7 May 2014 respectively.

On 19 & 20 March 2014, training was held for Group A (4 doctors and 2 Senior Nurses). On 10 & 11 April, Group B, 15 Nurses were trained and on 6 & 7 May 2014, Group C, 18 Medical Students were trained. There were altogether 3 Facilitators for the training programme. The trainees learned in pair as required by HBB protocol.

**Helping Babies Breathe Curriculum**

The HBB course consists of four main lessons:

1. Preparation for Birth
2. Routine Care
3. The Golden Minute
4. Ventilation with normal or slow heart rate
5. Each lesson was introduced by the main facilitator. After a demonstration, participants completed a number of self-directed and self-assessment exercises using a learner workbook and a flip chart. The training comprised 10 classroom hours and was given in two days.
6. A series of procedures surrounding a birth were reviewed through practical exercises under the supervision of the trainers. Scenarios reproducing routine care and neonatal resuscitation at birth were performed on a Neonatalie New born Simulator (Laerdal Medical Foundation, Stavanger, Norway). One Simulator, a stethoscope, an HBB resuscitator and suction device were available for every two trainees. HBB emphasized Hands on training rather than theoretical Knowledge.<sup>9,10</sup>

The course was conducted in Nepali and English language since most of the participants were adaptable to both the languages. HBB curriculum was written in Nepali.

**Evaluation of knowledge and practical skills**

A 15 minute written test with 17 multiple-choice questions based on the HBB flip chart was given to participants before and after the training to evaluate their knowledge. It was available both in Nepali as well as English Languages.

The practical evaluation performed after training consisted clinical simulations using the Neonatalie Newborn Simulator. An instructor directed the participants and noted their abilities as they demonstrated their skills on a mannequin. An Objective Structured Clinical Evaluation B (OSCE B) contained in the HBB flip chart was the basis of this performance test.

The OSCE B includes 18 items reflecting the key components of the course. Each item was scored a 1 if carried out correctly. Any partially correct or incorrect action was scored as 0. A –passing score required 14 items to be successfully completed (78%) of a total of 18 tasks. The 14 items correctly performed must include the following main procedures:

1. Recognizes the baby is not breathing
2. Ventilates at 40 breaths per minute
3. Looks for chest movement and improves ventilation.

At the end of the training session, participants were asked for

feedback on the quality of the HBB course by using a 5- point likert scale of satisfaction (“strongly disagree” to “strongly agree”). A discussion session about the results of the pretest and posttest was held with participants at the end of the course.

**Data management and analysis**

Data from answer sheets and evaluation checklists were collated and entered into Excel and then exported to SPSS version 20, where pretest and posttest were computed. All files containing data for knowledge and performance evaluation at the above two points in time were merged before analysis. Measures of paired t- test were repeatedly used to ascertain differences in mean scores between the written pretest and posttest. Results were expressed and reported a mean of right answers ± SD. A p- value < 0.05 was considered statistically significant.

The study was approved by CMC-Institutional Review Committee.

**RESULTS**

Of total 39 participants, all completed the resuscitation and assessment course. The professional characteristics of the participants were Pediatricians, Gynecologist, Medical Officer, Nurses and Medical Students from the teaching Hospital. Among the trainees 10% were doctors, 44% were nurses and 46% were medical students. Written test scores improved significantly (P <0.001) after the course for Group B and Group C. It was not statistically significant for Group A, (P= 0.05). All scores substantially improved after training.

On feedback submitted by the participants immediately after course, all agreed that they had learned how to help babies breathe.

**Table 1: Effectiveness of Training Programme**

Variable	Sample Size	Pretest mean±SD	Posttest mean±SD	t value	P value
Group A*	6	15.17±1.722	17.00±0.00	-2.61	0.05
Group B**	15	14.20±2.305	16.80±0.414	-5.52	<0.001
Group C***	18	13.39±1.420	16.83±0.383	-9.72	<0.001
Total	39	13.97±1.91	16.85±0.366	-9.47	<0.001

\*Group A- Doctors and Senior Nurses

\*\* Group B- Nurses

\*\*\*Group C- Medical Students

The P value for Group A was found to be 0.05 which shows that there was no statistical significance for effectiveness of the training programme. Since the P value for Group B, Nurses and Group C, medical students was less than 0.001, the effectiveness of Helping Babies Breathe Training on neonatalie new born simulator was found to be significant.

**DISCUSSION**

Most of the participants significantly improved their Knowledge

after the two day training programme. Although the P value for the Doctors and Senior Nurses, that is Group A was not found to be significant (0.05). One of the reasons might be that the senior professionals already had expertise in their relevant field.

The training has certain limitations. OSCE B was not used for the pretest, since it was considered too difficult, although it was used after the course. Similar study done in Rwanda also considered OSCE B vast to be considered a Pretest. Although our findings revealed a potential benefit of HBB as an educational training on new born simulator we could not evaluate the impact of this training on newborn outcomes.<sup>9</sup>

One of the studies done among birth attendants in a rural hospital in Tanzania found that the participants performed significantly better in simulated neonatal care and resuscitation seven months after one day of HBB training but this improvement did not transfer into clinical practice.<sup>7</sup>

One of the strengths of the study was the instruments used to evaluate knowledge and skills which were previously validated and standardized by the American Academy of Pediatrics.<sup>10</sup>

The HBB programme was taught in Nepali and English which was easy to understand and the HBB curriculum was in Nepali and English languages. The participants could easily understand both the languages.

## CONCLUSION

The present study demonstrates that HBB training on Neonatalie newborn simulator significantly improved the knowledge of the participants. Together with the refresher course on timely manner will ensure that the participants are better prepared to meet neonatal emergencies in low-income countries like Nepal where most deliveries occur at homes by traditional birth attendants.

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